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ABSTRACT

The auditory perception skills of 32 learning disabled (LD) and 32 non LD culturally different elementary pupils were compared. Results of the Wepman Auditory Discrimination Test and three subtests of the Illinois Test of Psycholinguistic Abilities indicated consistent differences between the two groups on all four measures of auditory perception (auditory discrimination, auditory memory, auditory closure, and sound blending). Both groups evidenced deficiencies in auditory perception skills, with auditory memory skills being the least deficient and sound blending the most deficient. Among the educational implications of the study was the need for directing primary attention to the treatment of learning disabilities in the culturally different LD child. (CL)

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AUDITORY PERCEPTION IN LEARNING DISABLED AND NONLEARNING DISABLED CULTURALLY DIFFERENT PUPILS

A Paper

Presented at

The International Federation of Learning Disabilities

by

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Introduction. MacGinitie (1967) has stated that auditory perception is one of the various factors in reading that has not been researched adequately. Although previously there have been extensive research efforts in the area of visual perception, recently there have been an increasing number of investigations and studies conducted in the field of auditory perception (Bland, 1970; Deutsch, 1964; Durrell & Murphy, 1953; Dykstra, 1966; Price, 1973; and Wepman, 1960).

The general hypothesis underlying the interest in auditory perception is that some range of auditory skills may be prerequisite for able reading. Deutsch (1964) suggested that a particular minimum level of auditory discrimination skill, for example, may be necessary for the acquisition of reading and of general verbal skills. Another skill, auditory sequential memory, may also be a critical one in the battery of auditory skills. Golden and Steiner (1969) hypothesized that the lack of accurate memory of the sequence of sounds may be a factor which affects reading progress in general and the acquisition of word attack skills in particular. Still another skill, that of auditory blending, seems to be positively related to success in beginning reading, according to MacGinitie (1967). In a study of auditory blending ability as a factor in success in beginning reading, it was found that blending ability has a significant relationship to reading achievement, especially as it relates to word recognition and analysis (Chall, Roswell & Blumenthal, 1963).

The results of the study indicated that children with severe reading disabilities also had extreme difficulty in learning phonics. Blending and synthesizing sounds presented the greatest problems.

Purpose of the Study. The problem investigated in this study was concerned with the auditory perception skills of learning disabled and nonlearning disabled children within the classification of the culturally different. The relationship between the auditory levels of Myklebust's (1960) developmental hierarchy of language, those of auditory receptive language and auditory expressive language, and the two subgroups of the culturally different formed the basis of the investigation. It was suggested that the culturally different child may encounter difficulty in the transition from the auditory expressive language level to the visual receptive language level of Myklebust's hierarchy due to the interference of the nonstandard English dialect. It was further suggested that the culturally different child, who is also identified as learning disabled, may be impeded at an even lower level of development, either that of auditory expressive language or of auditory receptive language. Therefore, the study addressed itself to the problem of identifying and comparing aspects of auditory perception which may contribute to learning disabilities and subsequent reading difficulties in culturally different children. Auditory discrimination, auditory sequential memory, auditory closure, and auditory or sound blending were the specific skills under investigation.

Related Research. The literature related to the culturally different and their language seems to fall into two broad categories: one category regards this language as deficient and substandard (Bereiter & Engelmann, 1966; Bromwich, 1968; Lewis, 1967; and Moore, 1965). The other category views as different and nonstandard but as efficient as standard English for the processes of thought and communication (Cohen & Cooper, 1972; Elkind, 1973; Goodman & Buck, 1973; Houston, 1970; Mukerji, 1966; and Olsen, 1965). Within the framework of the second category, it may be assumed that auditory perception skills are as developed for the speaker of the nonstandard English dialect as for the speaker of standard English.

The literature related to auditory perception generally supports the assumption that there is a direct relationship between auditory perception abilities and reading ability (Chall, et al., 1963; Deutsch, C., 1964; Golden & Steiner, 1969; and MacGinitie, 1967). Research concerned with the four auditory perception skills examined in this study indicates a relationship between the mastery of these skills and proficient reading.

The findings concerned with the factors of age, sex and I.Q. as they relate to auditory perception are not yet conclusive (Chall, et al., 1963; Jorgenson & Hyde, 1974; Rude, et al., 1975; Stephenson, 1969; Thompson, 1963; and Wepman, 1960). On the other hand, the studies investigating the factor of socio-economic status and its role in auditory perception conclude that there is a direct correlation between auditory perception and socio-economic status (Clark & Richards, 1966; Deutsch, C., 1964; Grotberg, 1965; Jensen, 1967; Kirk, 1972, Oakland, et al., 1973; and Sardy, 1970).

Procedures. A sample of 64 elementary pupils (Mean C. A. = 10.07), in public schools in New Orleans, Louisiana, serving culturally different student populations, was chosen through random selection. Thirty-two were drawn from classes for the learning disabled and thirty-two from regular classes. Criteria for placement in a learning disabilities class included a minimum I.Q. of 80 on the Stanford-Binet Intelligence Scale, Form L-M or the Wechsler Intelligence Scale for Children. Subjects in the sample of nonlearning disabled pupils were not receiving special services, such as speech therapy nor had they been referred for special testing.

The auditory perception skills of the subjects were measured by the Wepman Auditory Discrimination Test Revised Edition (1973) and three subtests of the Illinois Test of Psycholinguistic Abilities Revised Edition (1968): Auditory Sequential Memory, Auditory Closure and Sound Blending.

Two fixed factor analysis of covariance was utilized to analyze the data. This statistical procedure was selected to enhance the precision of the analysis and to employ the procedure most appropriate for the interval level data obtained for both the covariate (I.Q.) and the dependent variable (the data provided by each of the four measures of auditory perception skills). A summary of the data is presented in Table 1.

Results. The results of the analysis of covariance were as follows:

1. There is a significant difference (a = .005) between culturally different learning disabled and nonlearning disabled pupils in terms of auditory discrimination ability as measured by the Wepman Auditory Discrimination Test. The auditory discrimination ability of both groups of learners is adversely affected by the common factor of cultural differences.

TABLE I

Summary of Statistics

Measure of Auditory Perception	N		Covariate (I.Q.)		Adjusted Dependent Variable Mean			
					First Factor: Groups of Learners		Second Factor: Sex of Learners	
	LD	NLD	LD	NLD	LD	NLD	M	F
Wepman ADT	32	32	85.62	85.31	22.10	25.45	24.18	23.38
ITPA Auditory Memory	32	32	85.62	85.31	39.34	43.90	41.37	41.87
ITPA Auditory Closure	32	32	85.62	85.31	23.17	29.94	26.04	27.08
ITPA Sound Blending	32	32	85.62	85.31	20.15	27.81	23.27	24.69

For the learning disabled pupils, auditory discrimination ability is also negatively affected by their classification of learning disabilities.

2. There is a significant difference (a = .01) between culturally different learning disabled and nonlearning disabled pupils in terms of auditory memory as measured by the ITPA subtest of Auditory Sequential Memory. Both groups of learners exhibit a lack of ability in the area of auditory sequential memory. Such a deficiency is attributed to the characteristic of cultural difference common to both groups. The presence of learning disabilities compounds the deficit for the learning disabled pupils.

3. There is a significant difference (a = .001) between culturally different learning disabled and nonlearning disabled pupils in terms of auditory closure ability as measured by the ITPA subtest of Auditory Closure. The inferior auditory closure ability of both sets of learners is directly attributable to the characteristics of the nonstandard English dialect spoken by the culturally different. Elements of this restricted code are carried over to the elaborated system of standard English but without the appropriate expansion. Hence, a deficiency in auditory closure is apparent. The deficit is even more pronounced for the learning disabled pupils as observed in the difference favoring the nonlearning disabled pupils.

4. There is a significant difference (a = .001) between culturally different learning disabled and nonlearning disabled pupils in terms of auditory blending ability as measured by the ITPA subtest of Sound Blending. Both groups of learners manifest an inferior sound blending ability that is the product of the nonstandard English dialect common to their classification of culturally different.

Table 2

Analysis of Covariance of the Scores on the Wepman Auditory Discrimination Test (With I.Q. as the Covariate) for Learning Disabled and Nonlearning Disabled Groups With Two Levels of Sex

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Squares	F
LD NLD	1	179.38	179.38	11.10*
Sex M F	1	10.25	10.25	0.63
LD NLD X Sex M F	1	129.68	129.68	8.02**
Error	59	952.88	16.15	
Total	62	1272.21		

*Significant at the .005 level

**Significant at the .01 level

$_{.995}F_{1,59} \simeq 8.49$

$_{.99}F_{1,59} \simeq 7.08$

Table 3

Analysis of Covariance of the Scores on the ITPA Subtest of Auditory Sequential Memory (With I.Q. as the Covariate) for Learning Disabled and Non-learning Disabled Groups Crossed With Two Levels of Sex

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Squares	F
LD NLD	1	332.24	332.24	8.03*
Sex M F	1	3.85	3.85	0.09
LD NLD X Sex M F	1	44.04	44.04	1.06
Error	59	2438.95	41.33	
Total	62	2819.10		

*Significant at the .01 level

$.99\ F_{1,59} \simeq 7.08$

Table 4

Analysis of Covariance of the Scores on the ITPA Subtest of Auditory Closure (With I.Q. as the Covariate) for Learning Disabled and Non-learning Disabled Groups Crossed With Two Levels of Sex

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Squares	F
LD NLD	1	733.42	733.42	14.46*
Sex M F	1	17.42	17.42	0.34
LD NLD X Sex M F	1	29.96	27.96	0.55
Error	59	2990.85	50.69	
Total	62	3769.66		

*Significant at the .001 level

$.999\ F_{1,59} \simeq 11.97$

Table 5

Analysis of Covariance of the Scores on the ITPA Subtest of Sound Blending (With I.Q. as the Covariate) for Learning Disabled and Nonlearning Disabled Groups Crossed with Two Levels of Sex

Source of Variance	Degrees of Freedom	Sum of Squares	Mean Squares	F
LD NLD	1	938.41	938.41	23.35*
Sex M F	1	31.95	31.95	0.79
LD NLD X Sex M F	1	87.47	87.47	2.17
Error	59	2370.73	40.18	
Total	62	3428.58		

*Significant at the .001 level

$.999\ F_{1,59} \simeq 11.97$

Table 6

The Covariates of I.Q.

For the First Factor: Groups of Learners

And the Second Factor: Sex of the Learners

Factor	Covariate of I.Q.		
	Mean	Variance	STD
Groups of Learners			
Level 1			
Learning Disabled	85.62	29.14	5.39
Level 2			
Nonlearning Disabled	85.31	62.54	7.90
Sex of the Learners			
Level 1			
Male	85.78	54.95	7.41
Level 2			
Female	85.15	36.58	6.04

Table 7

Chronological Ages of the Subjects

For the First Factor: Groups of Learners

And the Second Factor: Sex of the Learners

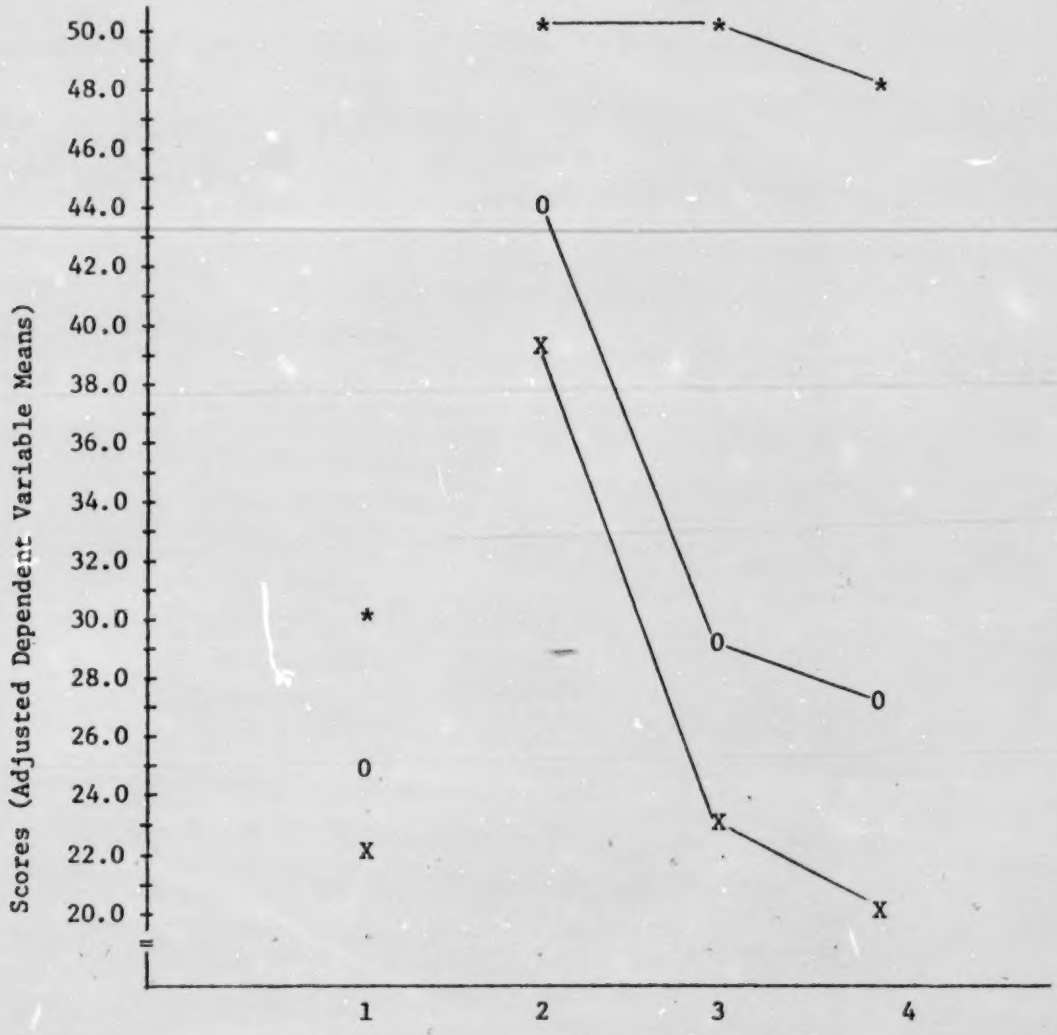
Factor	Chronological Age		
	Mean	Variance	STD
Groups of Learners			
Level 1			
Learning Disabled	9.84	1.13	1.06
Level 2			
Nonlearning Disabled	10.30	.43	.65
Sex of the Learners			
Level 1			
Male	10.06	1.13	1.06
Level 2			
Female	10.07	.44	.66

The difference of notable proportions between the learning disabled and nonlearning disabled groups favors the latter and emphasizes the adverse effect of the characteristic of learning disabilities on language-related skills such as sound blending. The evidence of a marked deficiency in the area of sound blending on the part of the learning disabled group is not surprising when the skill of sound blending is considered as the synthesis of the three other skills of auditory perception examined in this study. Sound blending requires an ability to discriminate the sounds, to reproduce the sounds in sequence, and to reproduce a complete word. The inabilities of the learning disability group in terms of auditory discrimination, auditory sequential memory and auditory closure as measured by the present investigation presuppose a similar inability in sound blending, which is borne out by the findings.

The consistent differences between the two groups of learners on all four measures of auditory perception may be readily noted in Figure 1.

Conclusions. Based upon careful consideration of the findings presented in this study, the following conclusions seem justified:

1. The auditory language ability of culturally different pupils and of learning disabled pupils within that category, to a greater extent, appears to be impaired. Within this framework of deficiency in auditory perception, as measured in this investigation, the skill of auditory sequential memory seems to be the least deficient and the skill of sound blending seems to be the most deficient. Consequently, the transition from auditory expressive language to visual receptive language on Myklebust's developmental hierarchy of language is impeded. The lack of firmly established auditory



Measures of Auditory Perception Skills Corresponding to the Four Research Hypotheses

*Possible score
0 Nonlearning Disabled Group (N = 32)
X Learning Disabled Group (N = 32)

1 - Wepman Auditory Discrimination Test
2 - ITPA Auditory Memory
3 - ITPA Auditory Closure
4 - ITPA Sound Blending

Figure 1 A comparison of scores of the learning disabled group and the nonlearning disabled group on four measures of auditory perception skills.

perception skills seems to result in a lack of proficient reading ability in the culturally different learning disabled pupils.

2. Auditory perception skills appear to be affected most by the factor of learning disabilities. In every measure of auditory perception examined in this study, the greatest discrepancies were recorded within the category of learning disabilities. The inferior auditory perception abilities of the learning disabled group were compounded by the factor of cultural difference but not to such a great extent.

3. Auditory perception skills seem to be a function of cultural difference. As previously confirmed by related research, the variable of socioeconomic status was found to have an effect on auditory perception skills that the variables of I.Q., chronological age and sex did not reveal, as measured by this study.

Implications for Educational Practices. Based on the conclusions just made relative to the findings of the present research, the following implications for educational practices are warranted:

1. In structuring educational programs for the culturally different learning disabled child, the primary thrust should be directed to the treatment of the learning disabilities. The learning disabilities represent the greatest impediment to the child's development of proficient language abilities and as such should receive the fullest consideration in prescribing educational strategies and techniques for the learning disabled child.

2. Using Myklebust's developmental hierarchy of language as a model,

language development procedures should be implemented for the culturally different learning disabled child. The procedures should follow the sequence outlined by Myklebust and should concentrate on the strengthening of deficits in auditory language before those in visual language. Likewise, the development of auditory receptive language should precede that of auditory expressive language. In terms of the auditory perception skills investigated in this study, auditory discrimination skill should be established before the skills of auditory sequential memory, auditory closure and auditory or sound blending. A firm foundation in auditory language should be considered prerequisite for the development of visual language.

3. The effects of the factor of cultural difference, particularly as manifested in the nonstandard English dialect of the culturally different, should be taken into consideration in planning and implementing educational programs for the culturally different, including the learning disabled. The language of the home should provide a basis for the development of the differing language of the school by maximizing similarities while respecting differences. The development of the standard English of the school setting should parallel the sequence delineated by Myklebust and should foster competency first in auditory language and then in visual language for culturally different pupils in general, and for learning disabled pupils who are also culturally different in particular.

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